

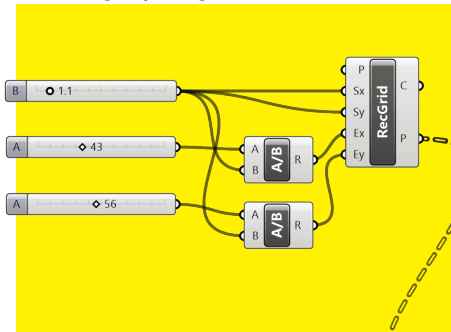


Attractor circles

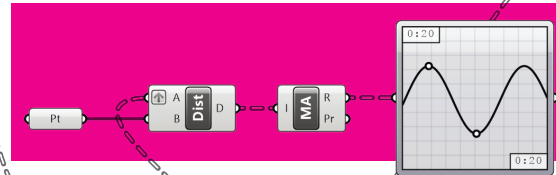
Material and Technology
Fredrik Skåtar

Overview

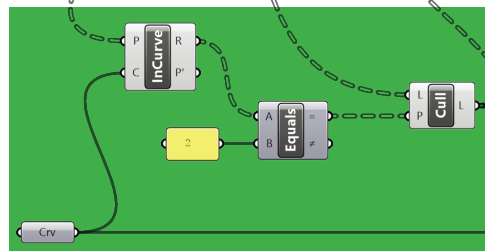
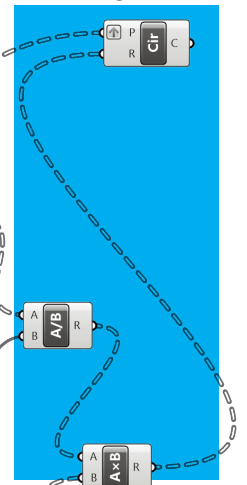
Setting up a grid



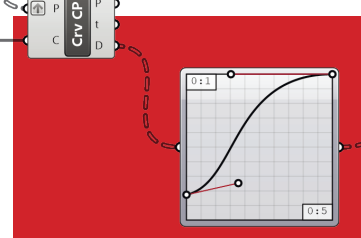
Setting an attraction formula



Building circles



Setting a boundary curve



Making a fade effect

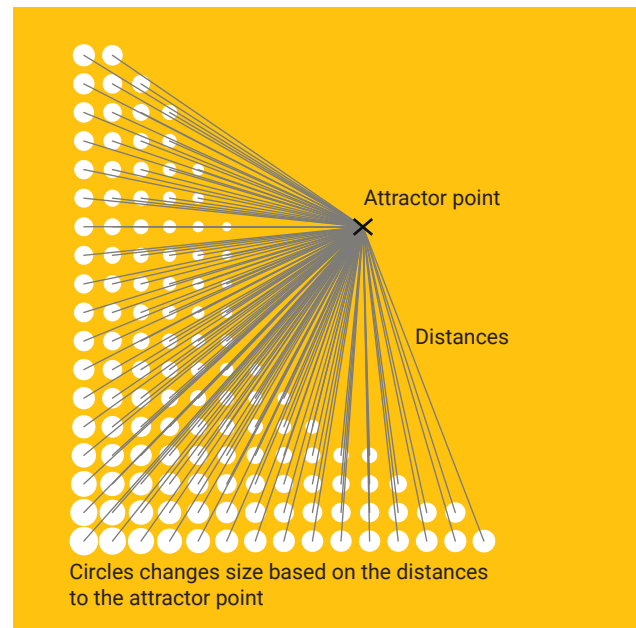
In this tutorial you will learn how to make a pattern of circles, each radius of which changes according to the distance to a certain coordinate.

The algorithm is based on a rectangular grid that defines a place for every circle. When an attractor point is set, a graph map may be applied to formulate an attracting law.

If needed, a boundary curve might be used to limit the area, where the formula of attraction is applied. It is also possible to make a fade effect so as to reduce the size of the circles near the boundary curve.

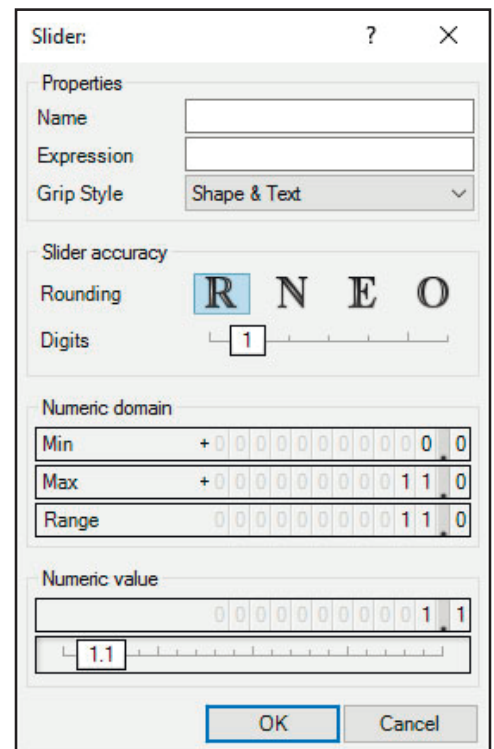
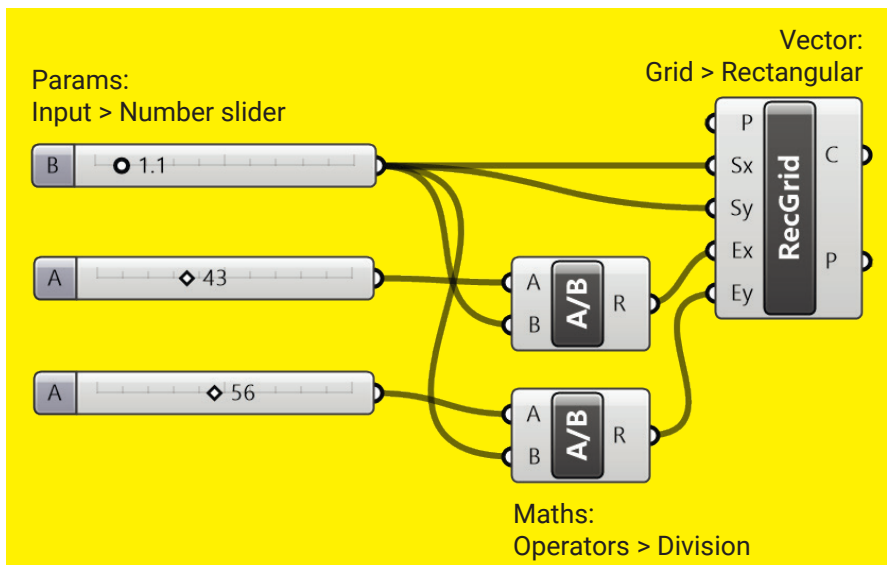
In the image above, lines are drawn between an attractor point and the center point of each circle. These distances are used to define the size of the circles so they are always smaller closer to the attractor point.

This same attractor could be used to change other parameters of the circles. For example, circles could be oriented so they are always facing the attractor point.



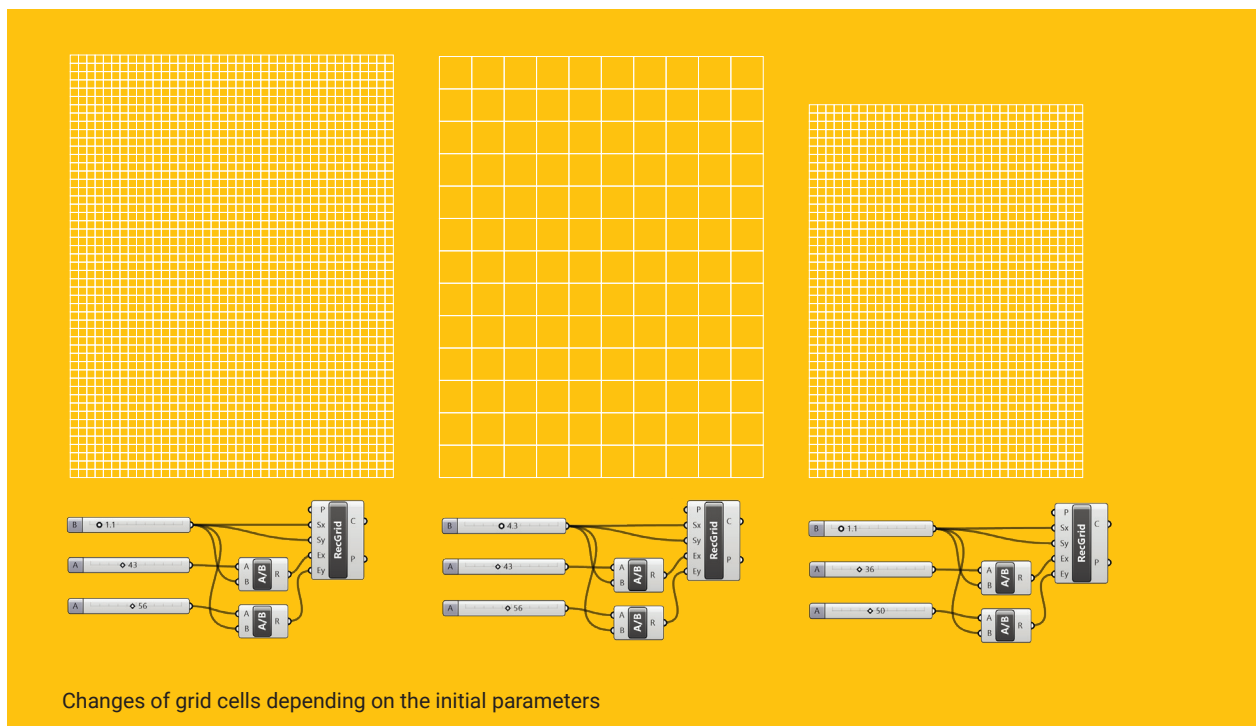
Circles changes size based on the distances to the attractor point

Setting up a grid



Double-click any place on the canvas and start typing the name of the component in an opened Key Word search window. You can also find any component in the panel and click it or drag and drop it to the canvas.

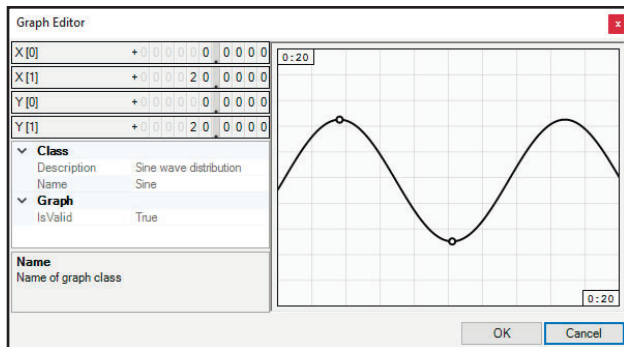
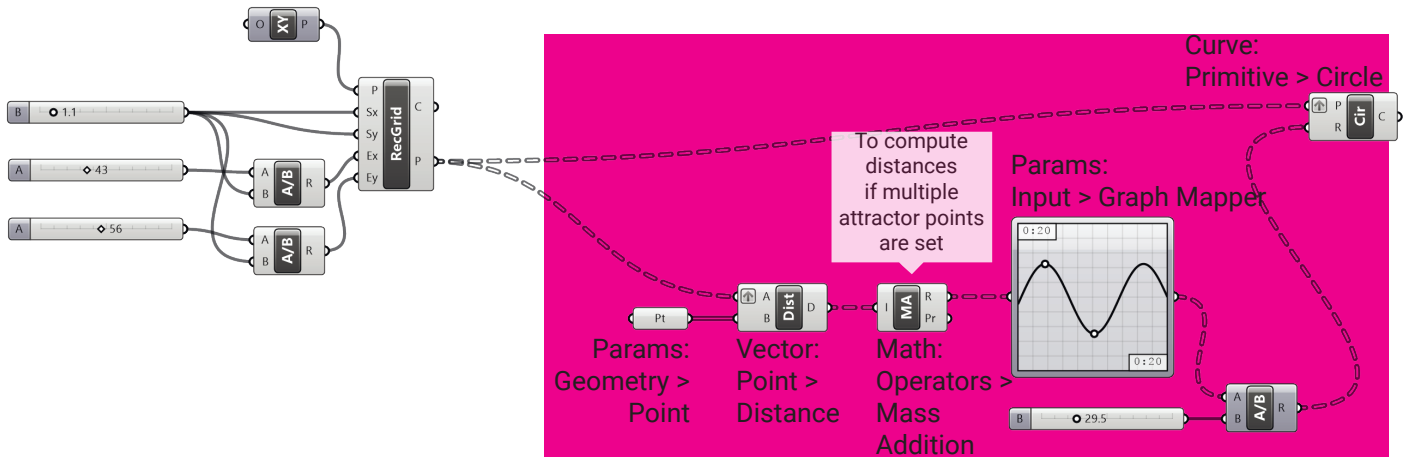
Double click the name of the **Slider** component to open the Slider Editor if you need to change it's parameters.



You can set the grid simply by directly connecting it with corresponding sliders but this method provides with the result that is more flexible.

Changes of grid cells depending on the initial parameters

Setting an attraction formula



To set graph in **Graph Mapper** right-click on the component, then select **Sine** or any other type of graph in **Graph Types** menu.

To open the **Graph Editor** double-click the component. For more visible result set **X[1]** and **Y[1]** parameters to 20.

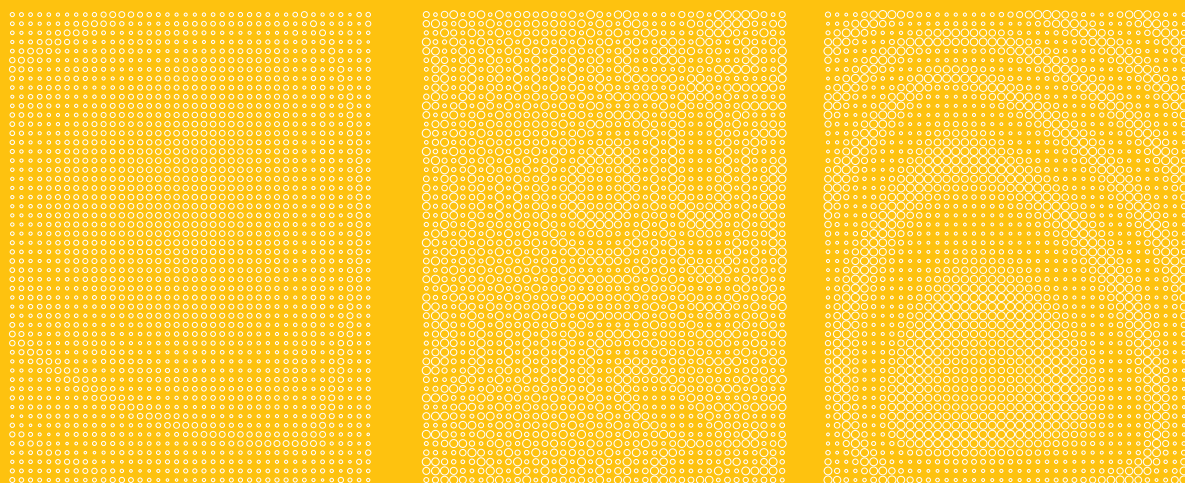
The **Distance** component computes distances between every point at grid corners and the indicated attractor point.

To set the attractor point right-click the **Point** component and choose **Set one Point** or **Set Multiple points** if more than on point is needed. Rhino workspace will become active and you will be able to select the points you want to set as attractors.

The Slider and the Division components makes controlling the radii more flexible.

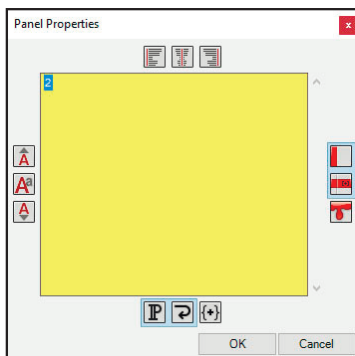
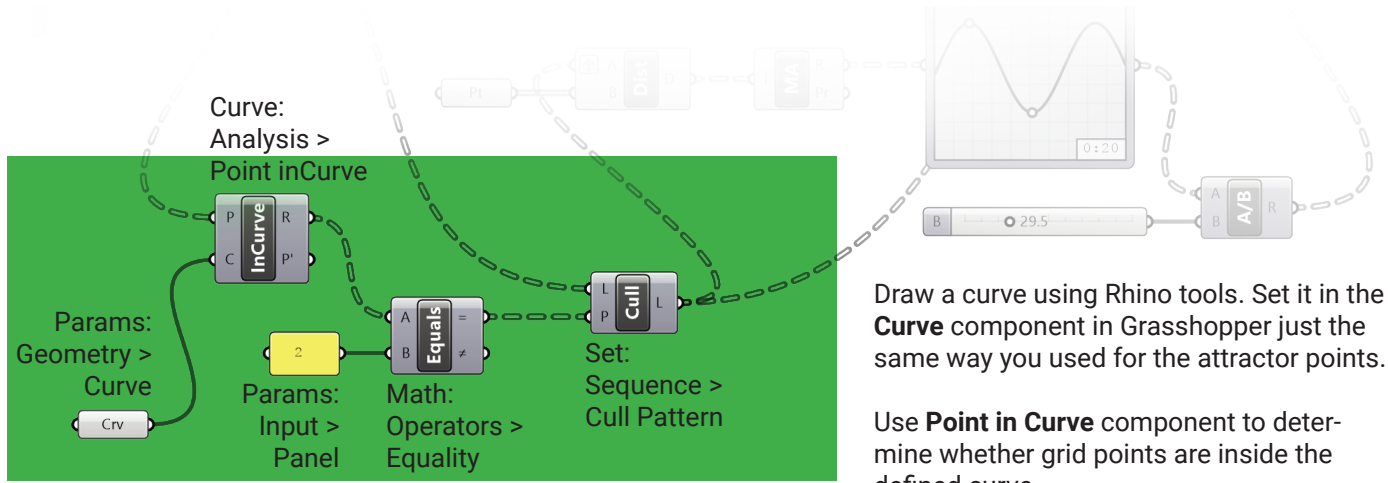


It is very important to graft the **A** parameter of the **Distance** component (and the **Plane** parameter of the **Circles** component). To do so, right-click this parameter and select **Graft** in the menu.

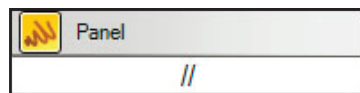


Changes of pattern depending on the position and amount of attractor points and Graph Mapper settings

Setting a boundary curve and making a fade effect



Double-click the **Panel** component to open its properties. Type "2" instead of example text. Make sure there is no punctuation left.



You can double-click anywhere on the canvas to launch a Key Word search and type double Slash to immediately find the **Panel** component.

Set **Panel** component as 2 as it means "Inside" according to **Relationship** output of the **Point in Curve** component.

Equality component will then define those elements that are inside and **Cull Pattern** will exclude the others.

The **Cull** component removes elements according to a repeating bit mask (in our case those outside the curve). This mask is defined as a list of Boolean (true or false) values.

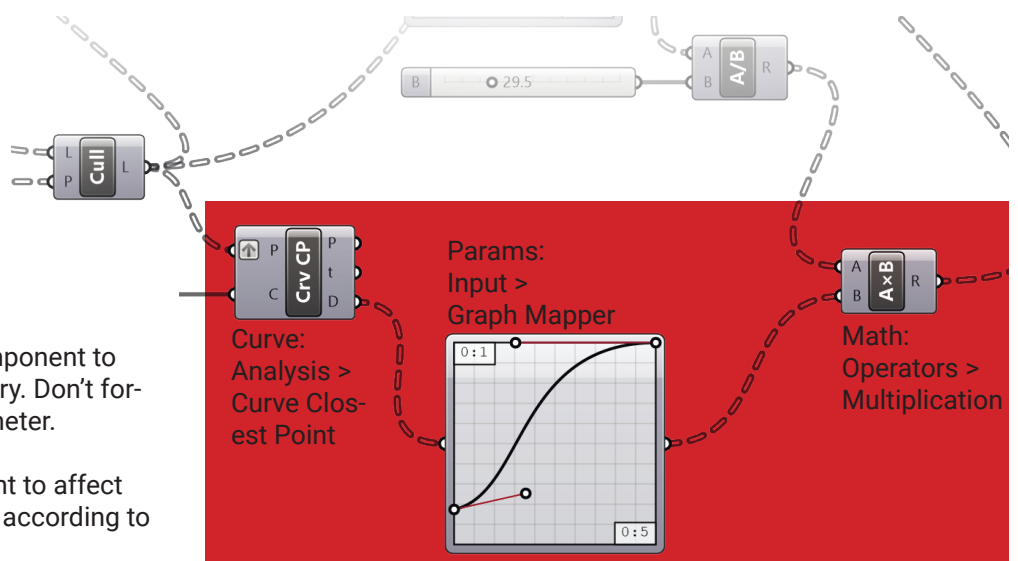
Point	A	B	C	D	E
Index	0	1	2	3	5
Pattern	True	False	True	False	True

Applying a bit mask to a list of data. False elements will be excluded.

To make a fade effect make one more **Graph Mapper** component and select **Bezier** in Graph Types menu. The result looks nicer if you increase the **X[1]** value in **Graph Editor**.

Use the **Curve Closest Point** component to find points closest to the boundary. Don't forget to graft the **Point** input parameter.

Add the **Multiplication** component to affect the radii circles so that they fade according to the defined graph.



Material and Technology

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